

# WEST Search History

DATE: Tuesday, August 20, 2002

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side by side

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result set

*DB=USPT; PLUR=YES; OP=ADJ*

L22	l21 and (director or disk drive)	108	L22
L21	((710/305 )!.CCLS. )	466	L21
L20	6389494.pn.	1	L20
L19	((710/126 )!.CCLS. )	0	L19
L18	((710/56 )!.CCLS. )	234	L18
L17	plurality adj3 l1	34	L17
L16	plurality adj l1	18	L16
L15	((near5/ )!.CCLS.  (l1/ )!.CCLS.  (plurality/ )!.CCLS. )	0	L15
L14	L12 and (l2)	37	L14
L13	L12 and (disk drive or director)	3286	L13
L12	((710/\$)!.CCLS.)	12848	L12
L11	((710/126 )!.CCLS. )	0	L11
L10	((710/126 )!.CCLS. )	0	L10
L9	l1 near10 (disk drive or director)	1	L9
L8	l2.ti,ab,clm.	6	L8
L7	6289401.pn.	1	L7
L6	L5.ti,ab,clm.	18	L6
L5	((plurality adj2 bus) or (dedicated near3 buse)) same (director or disk drive)	74	L5
L4	l2 near10 director	0	L4
L3	l2 near10 disk drive	0	L3
L2	L1 near10 (memory or cache)	104	L2
L1	point\$1to\$1point near3 connect\$	1998	L1

END OF SEARCH HISTORY

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L6: Entry 1 of 18

File: USPT

Jul 9, 2002

DOCUMENT-IDENTIFIER: US 6418511 B1

TITLE: Large capacity data storage systems using redundant buses

Abstract Text (1):

A data storage system wherein a host computer is coupled to a bank of disk drives through a system interface. The system interface includes a memory having a high address memory section and a low address memory section. A plurality of directors controls data transfer between the host computer and the bank of disk drives as such data passes through the memory. A pair of high address busses, comprising a plurality of bus high address bus segments, is in communication with the high address memory section and a pair of low address busses, comprising a plurality of low address bus segments, is in communication with the low address memory section. Each one of the directors is in communication with one of the pair of high address busses and one of the pair of low address busses.

## CLAIMS:

1. A data storage system wherein a host computer is coupled to a bank of disk drives through a system interface, such system interface, comprising:

a memory;

a data loop, comprising:

a bus, comprising a plurality of physically separated bus segments;

a plurality of directors for controlling data transfer between the host computer and the bank of disk drives as such data passes through the memory via the plurality of bus segments of the bus, and

wherein each one of the bus segments connects a pair of the plurality of directors in a daisy chain arrangement.

2. A data storage system wherein a host computer is coupled to a bank of disk drives through a system interface, such system interface, comprising:

a memory;

a bus, comprising a plurality of physically separated bus segments;

a data loop comprising a plurality of directors in communication with the memory through the plurality of bus segments, such plurality of directors controlling data transfer between the host computer and the bank of disk drives as such data passes through the memory via the data loop, and

wherein each one of the bus segments connects a pair of the plurality of directors in a daisy chain arrangement.

7. A data storage system wherein a host computer is coupled to a bank of disk drives through a system interface, such system interface, comprising:

a memory;

a data loop, comprising:

a plurality of directors; and

a plurality of bus segments;

wherein the plurality of directors are serially coupled in a daisy chain arrangement to the memory through the plurality of bus segments; and

wherein such directors are configured to control data transfer between the host computer and the bank of disk drives as such data passes through the memory, and

wherein each one of the bus segments connects a pair of the plurality of directors.

9. A data storage system interface, such interface being coupled to a bank of disk drives, comprising:

a memory;

a plurality of directors;

a data loop comprising a plurality of bus segments for serially coupling the plurality of directors to the memory in a daisy chain arrangement with pairs of the directors being connected by a corresponding one of the plurality of bus segments; and

wherein the directors control data transfer with the bank of disk drives as such data passes through the memory via the plurality of bus segments and the concatenated arranged directors.

10. A data storage system interface, such interface being coupled to a bank of disk drives, comprising:

a memory;

a plurality of directors for controlling data transfer with the bank of disk drives;

a data loop comprising a plurality of bus segments for serially coupling the plurality of directors to the memory in a daisy chain arrangement with pairs of the directors being connected by a corresponding one of the plurality of bus segments and with data in the data transfer serially passes through the memory via the plurality of bus segments and the concatenated arranged directors.

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L6: Entry 2 of 18

File: USPT

May 14, 2002

DOCUMENT-IDENTIFIER: US 6389494 B1

TITLE: System for interfacing a data storage system to a host utilizing a plurality of busses for carrying end-user data and a separate bus for carrying interface state data

## CLAIMS:

9. The system recited in claim 3 wherein the interface state data bus section includes a plurality of parallel busses, each one thereof being coupled to a one of the plurality of directors and to the memory.

18. The system recited in claim 13 wherein the interface state data bus section includes a plurality of parallel busses, each one thereof being coupled to a one of the plurality of directors and to the memory.

28. The system recited in claim 22 wherein the interface state data bus section includes a plurality of parallel busses, each one thereof being coupled to a one of the plurality of directors and to the memory.



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L6: Entry 4 of 18

File: USPT

May 8, 2001

DOCUMENT-IDENTIFIER: US 6230221 B1

TITLE: Data storage system having a host computer coupled to bank of disk drives through interface comprising plurality of directors, busses, and reference voltage generators

Abstract Text (1):

A data storage system wherein a host computer is coupled to a bank of disk drives through a system interface. The interface has a memory with a high address memory section and a low address memory section. A plurality of directors control data transfer between the host computer and the bank of disk drives as such data passes through the memory. A pair of high address busses electrically is connected to the high address memory and a pair of low address busses is electrically connected to the low address memory. Each one of the directors is electrically connected to one of the pair of high address busses and one of the pair of low address busses. A front-end portion of the directors is electrically connected to the host computer and a rear-end portion of the directors is electrically connected to the bank of disk drives. The bank of disk drives has a plurality of sets of electrically connected disk drives, each one of the sets being connected to a corresponding one of the input/output interfaces of a corresponding one of the rear-end directors through the adapter card connected to such corresponding one of the rear-end directors and, through the printed circuit board, to the adapter card in the another one of the electrical connectors and to the input/output interface of the rear-end director in such other one of the electrical connectors. Each pair of a plurality of bus arbiters is electrically connected to ends of a corresponding one of the busses. One of the arbiters is a master arbiter and the other a slave arbiter. A pair of reference voltage generator is also connected to ends of each bus.

## CLAIMS:

1. A data storage system wherein a host computer is coupled to a bank of disk drives through an interface, such interface comprising:

a memory;

a plurality of directors for controlling data transfer between the host computer and the bank of disk drives as such data passes through the memory;

a plurality of busses in communication with the directors and the memory;

a plurality of reference voltage generators each being electrically connected to a corresponding one of the busses, such bus coupling the generated reference voltage to each one of the directors electrically connected to such bus; and

wherein each one of the directors electrically connected to the bus includes a reference voltage receiver response to the generated reference voltage for distributing the generated reference voltage among electrical components in such director.

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L6: Entry 10 of 18

File: USPT

Oct 24, 1995

DOCUMENT-IDENTIFIER: US 5461723 A

TITLE: Dual channel data block transfer bus

## CLAIMS:

1. A data transfer system for transferring data to and from an array of disk drives, comprising:

an external computer interface;

a plurality of disk drive interfaces;

a block transfer bus for transferring blocks of data and having a first half and a second half;

each of said computer interface and said plurality of disk drive interfaces including an element for sending, or receiving data, said element being coupled to said block transfer bus including said first half and said second half, each element including means for transmitting a request for access to one of said first half and said second half or both of said first half and said second half and means for transmitting or receiving data over one of said first half and said second half or both of said first half and said second half;

master arbiter means coupled to said block transfer bus separately from said computer interface and said plurality of disk drive interfaces, for receiving said request for access and transmitting an access grant signal to said element for permitting access to one of said first half and said second half or both of said first half and said second half;

a multiple line bus request bus coupled between each of said plurality of disk drive interfaces and said master arbiter means; and

a plurality of bus grant lines, each of said bus grant lines being coupled between said master arbiter means and one of said plurality of disk drive interfaces.

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L9: Entry 1 of 1

File: USPT

Apr 17, 2001

DOCUMENT-IDENTIFIER: US 6219753 B1

TITLE: Fiber channel topological structure and method including structure and method for raid devices and controllers

Detailed Description Text (28):

First, we necessarily digress to briefly describe some background of fiber channels as a precursor to the discussion to follow. At least three basic fiber channel topologies are known: (1) so called "point-to-point", (2) arbitrated loop, and (3) Fibre channel fabric. The "point-to-point" topology connects each of two devices (such as a computer and a disk drive) by simple links (such as four wires or fibers, or two pairs), a transmit (Tx) pair at a terminal on DEVICE1 connected by the first link to the receive (Rc) terminal on DEVICE2, and a transmit (Tx) pair on a terminal on DEVICE2 connected by the second link to the receive (Rc) terminal on DEVICE1. The point-to-point topology is not readily applied to RAID arrays because only a single disk drive can be attached.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC
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Terms	Documents
l1 near10 (disk drive or director)	1

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